



Exploration & Production

GENERAL SPECIFICATION

ELECTRICAL

GS EP ELE 931

Technical Assessment of High Voltage Switchgear Assembly Manufacturers

00	01/2012	First issue
Rev.	Date	Notes

Owner: DEV/TEC	Managing entity: DEV/TEC/ELE
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1. Scope

This General Specification defines Company practices and tools to use to perform technical assessment of High Voltage Switchgear Assembly Manufacturers.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Standards

Reference	Title
Not applicable	

Professional Documents

Reference	Title
Not applicable	

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
GS EP ELE 131	High voltage switchgear
GS EP ELE 133	G.I.S. High voltage switchgear and controlgear



3. Technical assessment process of High Voltage Switchgear Assembly Manufacturers

The technical assessment process of a High Voltage Switchgear Assembly Manufacturer is part of the global assessment process of a Supplier, lead by the E&P Purchasing Division.

3.1 Step 1: Gathering of information

To start the technical assessment process, Appendix 1 of this document (Technical Information Analysis Form) shall be sent to the High Voltage Switchgear Assembly Manufacturer, by the Company.

The High Voltage Switchgear Assembly Manufacturer shall fill and send back this Form, to the Company, with all the others necessary documents requested.

3.2 Step 2: Data Analysis of Appendix 1 and following actions

After data analysis of Appendix 1, the ELE discipline of E&P Technology Division, shall take a decision to proceed or not to the next step of the Manufacturer technical assessment process.

3.2.1 Case 1: Negative result given by the data analysis of Appendix 1

In case of negative result given by the data analysis of Appendix 1, the technical assessment process shall stop at this step. The technical assessment result of the Manufacturer is negative.

3.2.2 Case 2: Positive result given by the data Analysis of Appendix 1 - Audit of Manufacturer production site mandatory

Following positive result of Appendix 1 data analysis, an audit of the Manufacturer production site is deemed mandatory by the ELE discipline of E&P Technology Division.

This audit shall be performed by the ELE discipline of E&P Technology Division, or by its representative, and will give final result of the Manufacturer technical assessment.

3.2.3 Case 3: Positive result given by the data Analysis of Appendix 1 - Audit of Manufacturer production site not necessary

Following positive result of Appendix 1 data analysis, an audit of the Manufacturer production site is not deemed necessary, by the ELE discipline of E&P Technology Division, to complete the technical assessment process. The technical assessment result of the Manufacturer is positive.

3.3 Step 3: Assessment notification to the Manufacturer

The outcome of step 2 analysis (negative, positive...) is consolidated by the authorized Company entity, together with others parameters (financial, contractual and social responsibility, quality, HSE...) for final decision.

Then, the authorized Company entity will notify the Manufacturer of the outcome of global assessment.



Appendix 1 Technical Information Analysis Form: High Voltage Switchgear Assembly Manufacturer - EXCEL spreadsheet



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Appendix 1

	Technical Information Analysis Form : High Voltage Switchgear Assembly Manufacturer	GS EP ELE 931 Appendix 1
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Quick guidelines to use this document : the objective of the following indications, are to help user to fill the **Technical Information Analysis Form**.

This document has to be sent to the manufacturer to start technical assessment process before any survey at manufacturer location.
The manufacturer has to fill all information requested in all tables.

1) "Production Range" card :

On this card, the manufacturer has to indicate all its production ranges submitted for approval.

After technical assessment, Total or its representative, is able to indicate for which production ranges the manufacturer is finally approved.

2) "Theme I to Theme III" cards :

The manufacturer has to fill all tables of each cards, in order to have a better understanding of its production capacities.

After analysis of manufacturer answers, Total or its representative, can make comments, in blue column, for each manufacturer answers.

3) "Global Synthesis" cards :

On this card all general information (name, address, contact of manufacturer, date of audit, assessment report n°, Total specifications linked,...) written will be automatically pasted in all the others cards.

The first section of this card has to be filled by the manufacturer by indicating general informations : name, address, contact, process concerned,...

The three other sections have to be filled by Total or its representative to summarize results and decisions after analysis of the

Technical Information Analysis Form.

In the last section, the signature of Total or its representative will be done, in order to validate the analysis result of this Form.



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MANUFACTURER			
Manufacturer Name xxx	Activity and Process of Audited Workshop xxx	Audit Date xxx	
Manufacturer Head Office Address xxx	Manufacturer contacts (name, function, email, phone,...) 		
Name & Address of Audited Workshop xxx			
TOTAL OR REPRESENTATIVE COMPANY TEAM - TO BE FILLED BY TOTAL OR ITS REPRESENTATIVE			
Total Project Concerned xxx	Total or Representative Responsible for Technical Information Analysis (Name, Function, Service) 		
Objectives of the Technical Information Analysis			
TECHNICAL INFORMATION ANALYSIS / TECHNICAL ASSESSMENT RESULT (FOR THE PRODUCTION RANGE CONSIDERED) - TO BE FILLED BY TOTAL OR ITS REPRESENTATIVE			
Result of Information Analysis of GS EP ELE 931 - Appendix 1, filled by the Manufacturer			
	Yes / No	Comments	
Level of information is appropriate			
On site Audit Requested			
Result of Technical Assessment of Manufacturer (to be filled if on site audit is not deemed necessary)			
	Decision *	Comments	
Satisfactory			
Reserves to close to be satisfactory			
Not satisfactory			
Notes : * : Tip when appropriate			
CONCLUSIONS OF TECHNICAL INFORMATION ANALYSIS / GENERAL COMMENTS - TO BE FILLED BY TOTAL OR ITS REPRESENTATIVE			
SIGNATURE OF TOTAL OR REPRESENTATIVE TEAM			
NAME	DATE	NAME	DATE



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MANUFACTURER		
Name & Address of Audited Workshop xxx	Activity and Process of Audited Workshop xxx	Audit Date xxx

ACTUAL PRODUCTION RANGE / APPROVED PRODUCTION RANGE OF THE MANUFACTURER
<i>To list all the actual production ranges of the manufacturer and select and comment the approved ones.</i>

			To be completed by the manufacturer		To be completed by Total or representative Company	
Type	Code	Designation	Actual maximum range capacities *		Approved maximum range capacities *	
Electrical switchboards	2331	HV electrical switchgear				

* Maximum Capacities to indicate : Voltage (V),....



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MANUFACTURER

Name & Address of Audited Workshop XXXX	Activity and Process of Audited Workshop XXXX	Audit Date XXXX
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THEME I - GENERAL ORGANIZATION

All facilities described herein are meant to be permanent in-house facilities only. Any sub-contracted activity must be clearly indicated showing the names and addresses of related Subcontractors. The number, type and status of all listed equipment are subject to thorough checks by the COMPANY representative in charge of the Plant Survey during his visit of the facilities.

Table 1.1.a - General Organization - Surface area (Plot plan to be joined if available)			
Zone	Surface area (m ²)	Description / Comments	Comments <i>To be filled by TOTAL or Company representative</i>
Overall			
Covered areas			
Offices			
Manufacturing workshops			
Metallurgical laboratory			
Material / component testing laboratory			
Material R&D laboratory			
Material life time and endurance laboratory			
Testing workshop			
Warehouses			
Covered storage areas			
Open air storage areas			

Table 1.1.b - General Organization - Manufacturer Management : organization chart to join			
Position	Names	Comments	Comments <i>To be filled by TOTAL or Company representative</i>
Managing Director			
Sales Manager			
Plant Manager			
Production Manager			
Quality Assurance Manager			
Design/Engineering Manager			
Quality Control Manager			
Customer care & change manager			
Industrial transfer project manager			
HSE Manager			
Logistic Manager			
Others			



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Name & Address of Audited Workshop	Activity and Process of Audited Workshop	Audit Date
XXX	XXX	XXX

THEME I - GENERAL ORGANIZATION

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Table 1.1.c - General Organization - Personnel					
Quality of Employees	Staff Quantity (manufacturer's personnel)	Contracted Personnel Quantity (personnel from external company which are working at the manufacturer)	Average years of service (staff)	Personnel qualification level (curriculum vitae)	Comments <i>To be filled by TOTAL or Company representative</i>
Commercial department					
Administration					
Project Management					
Engineering					
R&D / laboratory					
Procurement					
Expediting / Shipment					
Fabrication					
Testing					
Quality control					
Quality for in-coming material					
Quality assurance					
Management					
Number of Supervisory Personnel / Shop supervision					
Number of persons dedicated to customer site intervention					
Total number of Employees					

Table 1.1.d - General Organization - Communication With Customer / Working Documents Language				
	Language used with customer : YES / NO ?	Which department team (engineering, commercial, production,...) and how many people are able to discuss in other language than mother tongue ?	Documents (testing procedures, drawing, control procedures,...) available in which language ?	Comments <i>To be filled by TOTAL or Company representative</i>
English				
French				
Others				



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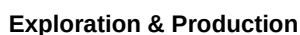
MANUFACTURER		
Name & Address of Audited Workshop XXXX	Activity and Process of Audited Workshop XXXX	Audit Date XXXX

THEME I - GENERAL ORGANIZATION

All facilities described herein are meant to be permanent in-house facilities only. Any sub-contracted activity must be clearly indicated showing the names and addresses of related Subcontractors. The number, type and status of all listed equipment are subject to thorough checks by the COMPANY representative in charge of the Plant Survey during his visit of the facilities.

Table 1.1.e - General Organization - Work Load Status and Commercial data		
Items to check	Comments / Description	Comments <i>To be filled by TOTAL or Company representative</i>
Ownership		
Annual turnover in M\$ or M€ (3 previous year)		
Average delivery time		
Men hour capacity		
Work shift : normal, 2x8, 3x8		
Present and future work load (%)		
Future investment (tools, building, human ressources,...)		
Number of international facilities		
Location of international facilities		

Table 1.1. f - General Organization - References on similar jobs (O&G)										
Year built	Customer (Total, others,...)	Country of installation	Switchboard Type	Form	Ambient temperature range	Offshore / Onshore Application	Short Circuit rating	Voltage rating	Frequency	Busbar Current Rating



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MANUFACTURER

Name & Address of Audited Workshop	Activity and Process of Audited Workshop	Audit Date
XXX	XXX	XXX

THEME I - GENERAL ORGANIZATION

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Table 1.1.g - General Organization - Range

Items to check	Description / Comments	Comments <i>To be filled by TOTAL or Company representative</i>
Product Voltage range		
Switchboard type and model		
Switchboard separation form		
Switchboard rating range (short circuit, ampere rating,...)		

[illegible]



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THEME I - GENERAL ORGANIZATION

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Table 1 - General Organization - List of documents to send by the manufacturer, to Total, in English (or French, if available) languages, with all Tables filled, before on site technical review			
List of documents	Documents received : YES / NO ?	Documents available in English (or French) language : YES / NO ?	Comments <i>To be filled by TOTAL or Company representative</i>
Plot plan, layout of the plant			
General organization chart			
Quality Control Organization Chart			
Products catalogue			
Process flow chart			
Manufacturing procedures			
Assembling procedures			
Testing procedures			
Repairing procedures			
Control procedures			
Non-conformities management procedures			
In-coming material inspection procedures			
Example of switchboard drawing with nomenclature			
Sub-contractor evaluation, follow-up and audit procedures			
Quality manual			
ISO certificates, Atex, IECEx certificates for accessories, others,....			
HSE policy			
Example of manufacturer's documents retranscribing the client's requirements			
Example of audit report : audit made by customer manufacturer or audit made by manufacturer on its sub-suppliers			



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MANUFACTURER

Name & Address of Audited Workshop	Activity and Process of Audited Workshop	Audit Date
XXX	XXX	XXX

THEME II - ENGINEERING

All facilities described herein are meant to be permanent in-house facilities only. Any sub-contracted activity must be clearly indicated showing the names and addresses of related Subcontractors. The number, type and status of all listed equipment are subject to thorough checks by the COMPANY representative in charge of the Plant Survey during his visit of the facilities.

Table 2.1.a - Engineering / Design Capacity - Sub-contracting				
	Yes / No	Sub-contractor name (external company which are working for the manufacturer, but outside the manufacturer)	Facilities of the sub-contractor (hardware, software, human ressources,...)	Comments <i>To be filled by TOTAL or Company representative</i>
Design				
Drawing				
Calculation				
Selectivity Studies and relay setting				

Table 2.1.b - Engineering / Design Capacity - Construction standards used, availability and updating of code and standard			
Standards	Date of Revision	Description / Comments	Comments <i>To be filled by TOTAL or Company representative</i>
IEC 60050-441			
IEC 60044-1			
IEC 60044-2			
IEC 60044-5			
IEC 60060			
IEC 60071			
IEC 60099			
IEC 60255			
IEC 60265-1			
IEC 60270			
IEC 60282			
IEC 60376			
IEC 60446			
IEC 60470			
IEC 60480			
IEC 60529			
IEC 60644			
IEC 60694			
IEC 60706			
IEC/TR 60787			
IEC 61000			
IEC 61850			
IEC 62262			
IEC 62271-SER			
Others			



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Name & Address of Audited Workshop	Activity and Process of Audited Workshop	Audit Date
XXX	XXX	XXX

THEME II - ENGINEERING

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Table 2.1.c - Engineering / Design Capacity - Deviation list to GS EP ELE 131

Item	Clause	Description	TOTAL Requirement	Manufacturer Proposal
1				
2				
3				
4				

Table 2.1.d - Engineering / Design Capacity - Deviation list of GS EP ELE 133

Item	Clause	Description	TOTAL Requirement	Manufacturer Proposal
1				
2				
3				
4				

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Name & Address of Audited Workshop XXXX	Activity and Process of Audited Workshop XXXX	Audit Date XXXX

THEME II - ENGINEERING

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Table 2.1.c - Engineering / Design Capacity - Calculation Facilities (Softwares for design calculation : finite element, thermal, flow, stress, hydraulic, electrical, others...)				
Type of Calculation	Design Codes / References	Computer Programs (Softwares) / Tools	Sub-contracted (if any) at external company	Comments <i>To be filled by TOTAL or Company representative</i>
Electrical calculation tool (short circuit, load flow, load balance)				
Selectivity study				
Component selection study/analysis				
Wire/cable/Busbar selection study/analysis				
Thermal calculation/analysis				
Harmonic calculation/analysis				
Electro-Magnetic Comptability analysis				
Switchboard/Panel layout study/analysis				
Obsolescence material data base				

Table 2.1.d - Engineering / Design Capacity - Drawing & Design Facilities					
Number of CAD Work Stations	Computer Program Names / Release	Number / Quantity of Permanent Staff	Staff Qualifications & Seniority	Sub-contracted (if any)	Comments <i>To be filled by TOTAL or Company representative</i>

Quantity of design engineers	Number of Permanent Staff	Staff Qualifications & Seniority	Sub-contracted (if any)	Comments	Comments <i>To be filled by TOTAL or Company representative</i>
Engineer :					
Draftman :					



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MANUFACTURER		
Name & Address of Audited Workshop XXXX	Activity and Process of Audited Workshop XXXX	Audit Date XXXX

THEME III - MANUFACTURING

All facilities described herein are meant to be permanent in-house facilities only. Any sub-contracted activity must be clearly indicated showing the names and addresses of related Subcontractors. The number, type and status of all listed equipment are subject to thorough checks by the COMPANY representative in charge of the Plant Survey during his visit of the facilities.

Table 3.1.a - Workshop General Organization - Manufacturing Organization		
Items	Description / Comments (Nb of production lines, tools,...)	Comments <i>To be filled by TOTAL or Company representative</i>
List of tests and controls of the switchboards/panel's component before fabrication process		
Pre-fabricated panels: structural materials, thickness, folding, bolting, painting,...		
Busbar preparation and fabrication		
Component selection and testing certificates		
Component installation		
Wiring and cabling		
Tagging and labelling		
Operational and Functional		
Time Schedule management		
Painting		
Manufacturing surface area		
Packing (standard, Marine, In-house ?...)		
Crane and handling capability in tons		

Table 3 - Sub-contracting : List of sub-contracted manufacturing operations					
Manufacturing Operations	Sub-contractor (name, address,...)	Under which conditions / for which reasons ?	% of sub-contracting	Comments (follow-up, supervision, proximity of workshop...)	Comments <i>To be filled by TOTAL or Company representative</i>



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MANUFACTURER

Name & Address of Audited Workshop	Activity and Process of Audited Workshop	Audit Date
XXX	XXX	XXX

THEME IV - PRODUCTS MANAGEMENT (CONTROL, TESTING, INSPECTION, STORAGE)

All facilities described herein are meant to be permanent in-house facilities only. Any sub-contracted activity must be clearly indicated showing the names and addresses of related Subcontractors. The number, type and status of all listed equipment are subject to thorough checks by the COMPANY representative in charge of the Plant Survey during his visit of the facilities.

Table 4.3.a - In-coming Material Management - Material Storage			
Type of Storage	Dimension (m ²)	Comments / Description (material stored,...)	Comments <i>To be filled by TOTAL or Company representative</i>
Covered storage yard			
Open storage yard			
Warehouse			
Specific warehouse (humidity, temperature controlled,...)			

Table 4.3.b - In-coming Material Management - Storage Conditions		
Storage Conditions for :	Description / Comments	Comments <i>To be filled by TOTAL or Company representative</i>
Small material		
Fragile material		
Others		

Table 4.5.a - Switchboards Testing - Facilities Description					
Type of test / control	Description of equipment : type, quantity, range capability	Calibration of equipment (certification, expired date)	Testing procedures and IEC standards (availability, issuance, updating)	Testing sub-contracted ? If yes, indicate the name of sub-contractor	Recording and measurement capability
Busbar and other component installation and bolting connection test					
Protection relays test facilities (including interface connection and communication with other facilities)					
Switchboard/panel mechanical test					
Switchboard/panel IP test					
Switchboard/panel type test					



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Name & Address of Audited Workshop	Activity and Process of Audited Workshop	Audit Date
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THEME IV - PRODUCTS MANAGEMENT (CONTROL, TESTING, INSPECTION, STORAGE)

All facilities described herein are meant to be permanent in-house facilities only. Any sub-contracted activity must be clearly indicated showing the names and addresses of related Subcontractors. The number, type and status of all listed equipment are subject to thorough checks by the COMPANY representative in charge of the Plant Survey during his visit of the facilities.

Switchboard/panel operation test					
Switchboard/panel function test					
Component communication interface test capability with customer devices					
Power-Frequency test					
Internal Arc withstand test (type test)					
Voltage test					
Impulse withstand test Voltage					
Temperature monitoring test					
Anti corrosion protective coating/painting test					
Lightning impulse test (high voltage equipment)					
Others					

Items	Comments / Description	Comments <i>To be filled by TOTAL or Company representative</i>
Material data base and software licence		
Inspection record data base		

Table 4.7.a - Finished Goods Management - Goods Storage			
Type of Storage	Dimension (m ²)	Comments / Description (material stored,...)	Comments <i>To be filled by TOTAL or Company representative</i>
Covered storage yard			
Open storage yard			
Warehouse			
Specific warehouse (humidity, temperature controlled,...)			

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printed 12/10/2011

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MANUFACTURER

Name & Address of Audited Workshop	Activity and Process of Audited Workshop	Audit Date
XXX	XXX	XXX

THEME IV - PRODUCTS MANAGEMENT (CONTROL, TESTING, INSPECTION, STORAGE)

All facilities described herein are meant to be permanent in-house facilities only. Any sub-contracted activity must be clearly indicated showing the names and addresses of related Subcontractors. The number, type and status of all listed equipment are subject to thorough checks by the COMPANY representative in charge of the Plant Survey during his visit of the facilities.

Table 4.7.b - Finished Goods Management - Storage Conditions		
Storage Conditions for :	Description / Comments	Comments <i>To be filled by TOTAL or Company representative</i>

Table 4.7.c - Finished Goods Management - Shipping Facilities				
Type	Maximum Dimension	Maximum Capacity	Comments / Description	Comments <i>To be filled by TOTAL or Company representative</i>
Rail				
Road				
Water ways				
Sea				

Table 4 - Procurement Practices - Manufacturer's Suppliers List / Source of Materials				
Material	Suppliers (Normally 2 to 3 suppliers for each items with long term agreement)	Number of audits / year	Comments (follow-up procedures, approval,...)	Comments <i>To be filled by TOTAL or Company representative</i>